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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,517	04/15/2004	Wide Hogengout	251859US2CRL	6470
22850	7590	03/28/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
VO, HUYEN X				
ART UNIT		PAPER NUMBER		
2626				
NOTIFICATION DATE		DELIVERY MODE		
03/28/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/824,517

**Applicant(s)**

HOGENGOUT ET AL.

**Examiner**

HUYEN X. VO

**Art Unit**

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/5508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. Applicant's arguments filed 12/28/2007 have been fully considered but they are not persuasive. The new limitation fails to specifically indicate duration of the delay, and whether the merging would take place at all after delaying. The prior art of record teaches a Viterbi algorithm, which is very well known in the speech recognition art, in that tokens at current node are combined with tokens of previous nodes to produce a word lattice (*typical in Viterbi decoding*). Even with fast computing system, there would be finite system delay before combination of tokens could take place. Applicant is advised to amend the claim to further indicate that delaying the merging of tokens of all nodes until the end of the word/phrase/sentence. And examiner believes that this is the intended invention discussed in the disclosure.

***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 27 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

4. Claim 27 is drawn to a "program" *per se* as recited in the preamble (*the term "computer readable medium" is not found in the specification. Thus it is considered*

*carrier waves*) and as such is non-statutory subject matter. See MPEP § 2106.IV.B.1.a. Data structures not claimed as embodied in computer readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention, which permit the data structure's functionality to be realized. In contrast, a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory. Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

5. Claims 1, 13-15, and 26-27 are drawn to a decoder for an automatic speech recognition system for determining one or more candidate text unit concatenation according to a predetermined criterion and which correspond to a speech segment. In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result" (*State*

*Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02).* In the present case, the final result of claims 1, 13-15, and 26-27 only refers delay a merging of the text unit concatenation based on the likelihood values and not the actual tangible transcription of the input speech as a result of speech recognition. As such, claims 1, 13-15, and 26-27 are directed to non-statutory subject matter. The dependent claims fail to overcome the 35 U.S.C. 101 rejection directed towards independent claims, and thus, are also directed to non-statutory subject matter.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-9, 11-23, and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Mitchell et al. (US 6574595).

8. Regarding claims 1, 13-15, and 26-27, Mitchell et al. disclose a decoder for an automatic speech recognition system for determining one or more candidate text unit concatenations according to a predetermined criterion and which correspond to a speech segment, the decoder comprising:

a processor arranged to receive a sequence of feature vectors corresponding to the speech segment (*col. 5, lines 43-50 or element 206 in figure 2A*);

the processor arranged to map with different likelihood values the feature vectors to sequences of nodes in a decoding network, every sequence representing a concatenation of text units (*col. 5, lines 50-55 or elements 208-210 in figure 2A*);

the processor arranged to determine one or more candidate node sequences in the decoding network corresponding to the candidate text unit concatenations by implementing a dynamic programming token passing algorithm in which each token corresponds to a node and is associated with a number of text unit concatenations and likelihood values for these concatenations, and wherein a token associated with a node in the decoding network is derived from the tokens associated with the previous nodes in the network (*col. 5, line 50 to col. 6, line 5 or referring to figures 2A-B*);

tokens from different nodes that are to be passed to a common node are combined to generate a new token corresponding to the common node and associated with an identifier for text unit concatenations and likelihood values associated with the previous tokens of said different nodes (*col. 5, line 50 to col. 6, line 5 or referring to figures 2A-B, this is well known in Viterbi decoding*); and

the processor is further configured to delay a merging of the text unit concatenations based on the likelihood values (*the processor would take some time (delay) before it could issue instructions to merge the tokens at different nodes*).

9. Regarding claims 2 and 16, Mitchell et al. further disclose wherein the processor is further arranged to merge a said token having a said identifier, the text unit concatenations of the said previous tokens being associated with said merged token

dependent on their corresponding likelihood values (*col. 5, line 50 to col. 6, line 5 or referring to figures 2A-B, beam search prunes away unlikely sub-word sequences leaving behind only likely sub-word sequences for further processing*).

10. Regarding claims 3-5 and 17-19, Mitchell et al. further disclose wherein said merging is only delayed if the token has a likelihood value below a delay-merge threshold (*col. 5, lines 50-67*), and wherein the processor is further arranged to prune tokens having likelihood values below a prune threshold (*col. 5, lines 50-67, beam search prunes away unlikely sub-word sequences*), and wherein the plurality of candidate text unit concatenations in a token are the text unit concatenations with the N-best likelihood values (*col. 5, lines 50-67, only most likely path are retained*).

11. Regarding claims 6 and 20, Mitchell et al. further disclose wherein the tokens are additionally associated with a number of category markers each corresponding to a said text unit concatenation, each category marker being associated with one of a plurality of categories, such that the plurality of candidate text unit concatenations in a token are the text unit concatenations with the best likelihood values in said plurality of categories (*col. 5, line 50 to col. 6, line 5, most likely paths are collected for each speech frame; these most likely paths are combined to form a plurality of final candidate paths; and the best scoring path is selected as the most likely sub-word sequence*).

12. Regarding claims 7 and 21, Mitchell et al. further disclose wherein the plurality of candidate text unit concatenations are the text unit concatenations with the N-best likelihood values in each said category (*col. 5, line 50 to col. 6, line 5, most likely paths are collected for each speech frame; these most likely paths are combined to form a plurality of final candidate paths; and the best scoring path is selected as the most likely sub-word sequence*).

13. Regarding claims 8-9 and 22-23, Mitchell et al. further disclose wherein the multiple text unit concatenations associated with each token are used to allow a statistical language model score to be added to the likelihood values associated with said text unit concatenations (*col. 3, line 55 to col. 4, line 13, language model known as grammar is used*), wherein the dynamic programming token passing algorithm is a Viterbi algorithm (*col. 3, lines 55-60*).

14. Regarding claims 11-12 and 25, Mitchell et al. further disclose wherein the tokens and the text unit concatenations are stored in logically separate memories (*col. 5, line 50 to col. 6, line 5*), and wherein a logically separate list data-structure is used to associate tokens with their text unit concatenations or identifiers and corresponding likelihood values (*col. 5, line 50 to col. 6, line 5*), and wherein the mapping means comprises an acoustic model based on Hidden Markov Models (*col. 3, lines 28-40, HMM*).



***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (US 6574595) in view of Chang et al. (US Pub. No. 2002/0178004).

17. Regarding claims 10 and 24, Mitchell et al. fail to specifically disclose wherein the dynamic programming token passing algorithm is a Baum-Welch algorithm. However, Dudemaine et al. teach that the dynamic programming token passing algorithm is a Baum-Welch algorithm (*section 50 on page 4-5*).

Since Mitchell et al. and Chang et al. are analogous art because they are from the same field of endeavor, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Mitchell et al. by incorporating the teaching of Chang et al. in order to train the speech HMM models using Baum-Welch to improve speech recognition accuracy.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUYEN X. VO whose telephone number is (571)272-7631. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2626

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Huyen X Vo/  
Primary Examiner, Art Unit 2626

3/13/2008

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**Application Number****Application/Control No.**

10/824,517

**Examiner**

HUYEN X. VO

**Applicant(s)/Patent under  
Reexamination**

HOGENGOUT ET AL.

**Art Unit**

2626